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A Survey on Bat Cestodes from Thailand with Descriptions of Six New Species

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ABSTRACT — Seven (including six new) species and two unidentified juveniles of the genus *Vampirolepis* (Cestoda: Cyclophyllidea: Hymenolepididae) were obtained from 214 bats composed of 31 species collected from various parts of Thailand between January 20 and February 19, 1982. *V. siamensis* sp. n. from *Hipposideros armiger* is related to but differs from *V. iwatensis* Sawada, 1975, in larger scolex and rostellar sac, slenderer neck, and medianly situated genital pore. *V. curvihamata* sp. n. from *Rhinolophus marshalli* differs from *V. ogaensis* Sawada, 1974, in the absence of neck, curved handle of rostellar hooks, triangularly arranged testes, smooth egg surface, and longer embryonic hooks. *V. versihamata* sp. n. from *R. affinis* differs from *V. chritensoni* (Macy, 1931) comb. n. and *V. gertschi* (Macy, 1947) comb. n. in the shape of rostellar hooks and triangularly arranged testes. *V. longicollaris* sp. n. from *R. coelophyllus* differs from *V. iriomotensis* Sawada, 1983, in the shape of rostellar hooks, longer neck, and triangularly arranged testes. *V. chiangmaiensis* sp. n. from *R. stheno* differs from *V. minatoi* Sawada, 1983, in more numerous and the shape of rostellar hooks, thicker outermost chorion of eggs, and longer embryonic hooks. *V. acollaris* sp. n. from *R. coelophyllus* differs from *V. isensis* Sawada, 1966, in the absence of neck, larger suckers, and triangularly arranged testes. *V. taiwanensis* Sawada, 1984, from *Miniopterus schreibersii fuliginosus* is first recorded from Thailand. Two unidentified juvenile *Vampirolepis* are reported from *Hipposideros armiger* and *Taphozous melanopogon*.

Cestode species parasitizing the bats indigenous to Thailand have been unknown up to the present. This study was carried out to clarify the cestode fauna of bats in Thailand.

MATERIALS AND METHODS

In total, 214 bats, composed of 31 species, were collected from various parts in Thailand from January 20 to February 19, 1982, by the second author and examined for cestodes by the first author. The detailed localities where the bat collections were made are shown on the map (Fig. 1). The bats were autopsied immediately after capture, and their alimentary canals were cut open as soon as possible, fixed in Carnoy's fluid, and brought to Japan. After being soaked in 45% acetic acid about 30 min for expanding, the alimentary canals were stored in 70% alcohol. Cestodes were obtained from these alcohol-preserved alimentary canals, stained with Heidenhain's hematoxylin, dehydrated in alcohol, cleared in xylene, and mounted in Canada balsam. Interference contrast light microscope was used when sufficient specimens were available. Measurements are given in millimeters.

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RESULTS

The bats and cestodes obtained are shown in Table 1. The cestodes found were as follows: *Vampirolepis siamensis* sp. n.; *V. curvihamata* sp. n.; *V. versihamata* sp. n.; *V. longicollaris* sp. n.; *V. chiangmaiensis* sp. n.; *V. acollaris* sp. n.; *V. taiwanensis* Sawada, 1984; juveniles of two *Vampirolepis* species; and unidentified specimens without scolex.

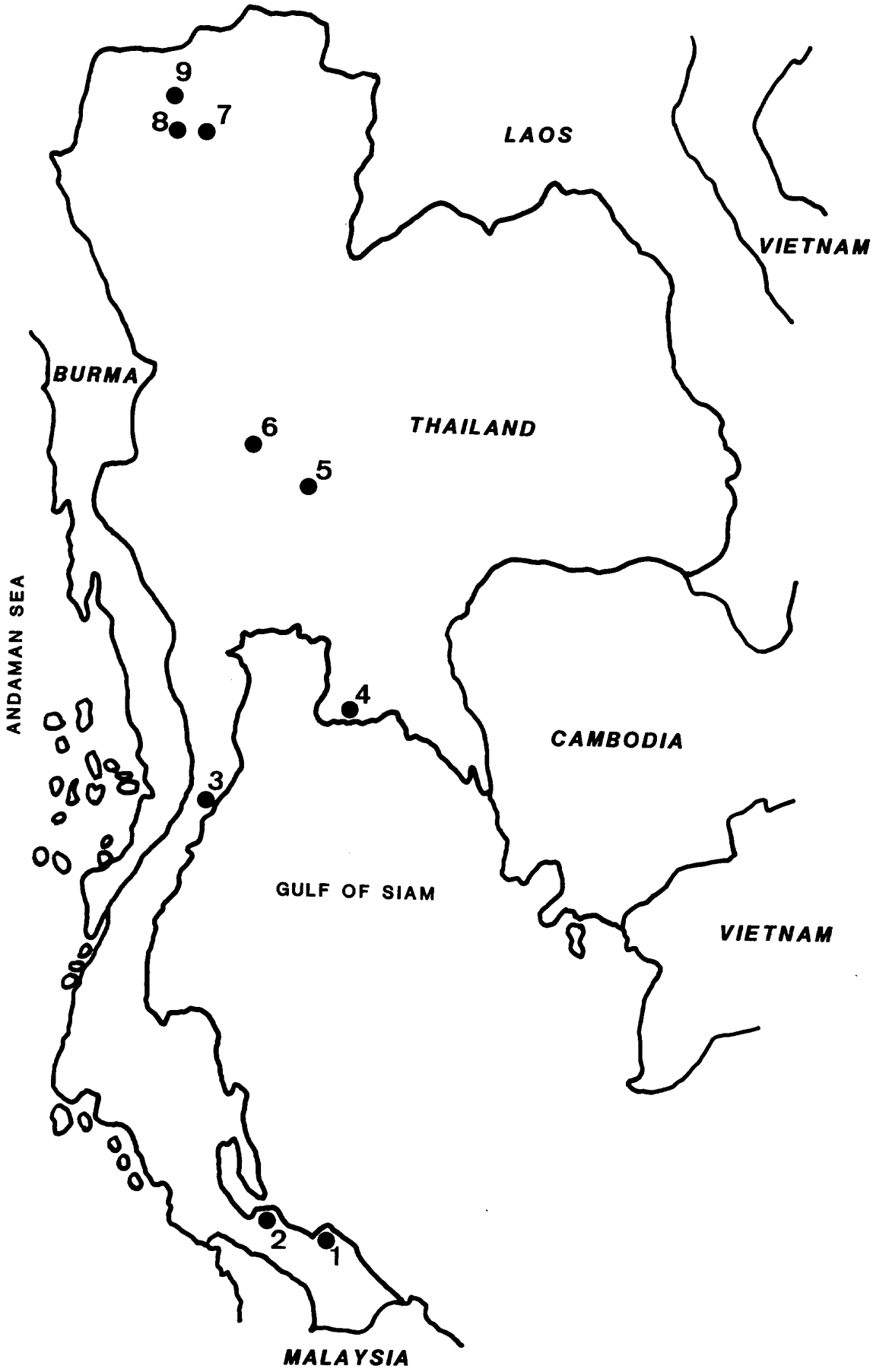


FIG. 1. A sketch map showing the collecting sites of the bats in Thailand. For the locality number, see Table 1.

TABLE 1. Bats examined and their cestode parasites in Thailand in 1982

Serial No. of locality in Fig. 1	Locality	Date	Bat species	Number of bats			Cestode species
				examined	infected	%	
1	Forest	20 Jan.	*Cynopterus sphinx*	10	0	0	
	Amphoe Khok Pho, Pattani		*C. brachyotis*	3	0	0	
			Eonycteris spelaea	2	0	0	
	Lime grotto		*Hipposideros larvatus*	2	0	0	
	Forest	21 Jan.	*Myotis mystacinus*	2	0	0	
			Macroglossus sobrinus	1	0	0	
	House		*Scotophilus kuhlii*	4	0	0	
	Fissure of rock-heap	22 Jan.	*Emballonura monticola*	5	0	0	
	Forest		*M. mystacinus*	2	0	0	
2	Lime grotto	23 Jan.	*Rhinolophus acuminatus*	2	0	0	
	Amphoe Nata Ves, Songkla						
	Forest	25 Jan.	*Tylonycteris robustula*	9	0	0	
			R. affinis	1	0	0	
			C. sp.	10	0	0	
			H. diadema	1	0	0	
3	Lime grotto	18 Jan.	*R. malayanus*	13	1	7	unidentified (no scolex)
	Amphoe Bang Saphan Yai,						
	Prachuap Khiri Khan	26 Jan.	*H. armiger*	12	1	8	*Vampirolepis* sp. 1
					1	8	*V. siamensis* sp. n.
4	Forest	16 Feb.	*C. sphinx*	5	0	0	
	Amphoe Muang Rayong, Rayong						
5	Lime grotto	13 Feb.	*H. bicolor*	11	1	9	unidentified (no scolex)
	Amphoe Muang, Lop Buri		*R. malyanus*	6	0	0	
			R. coelophyllus	9	0	0	
	Forest		*C. sphinx*	2	0	0	
6	Lime grotto	1 Feb.	*Taphozous melanopogon*	14	1	7	*Vampirolepis* sp. 2
	Amphoe Maung, Nakhon Sawan						
7	Lime grotto	2 Feb.	*R. marshalli*	2	0	0	
	Doi Chang Kieng, Chiang Mai						
		3 Feb.	*R. marshalli*	2	1	50	*V. curvihamata* sp. n.

TABLE 1. (Continued)

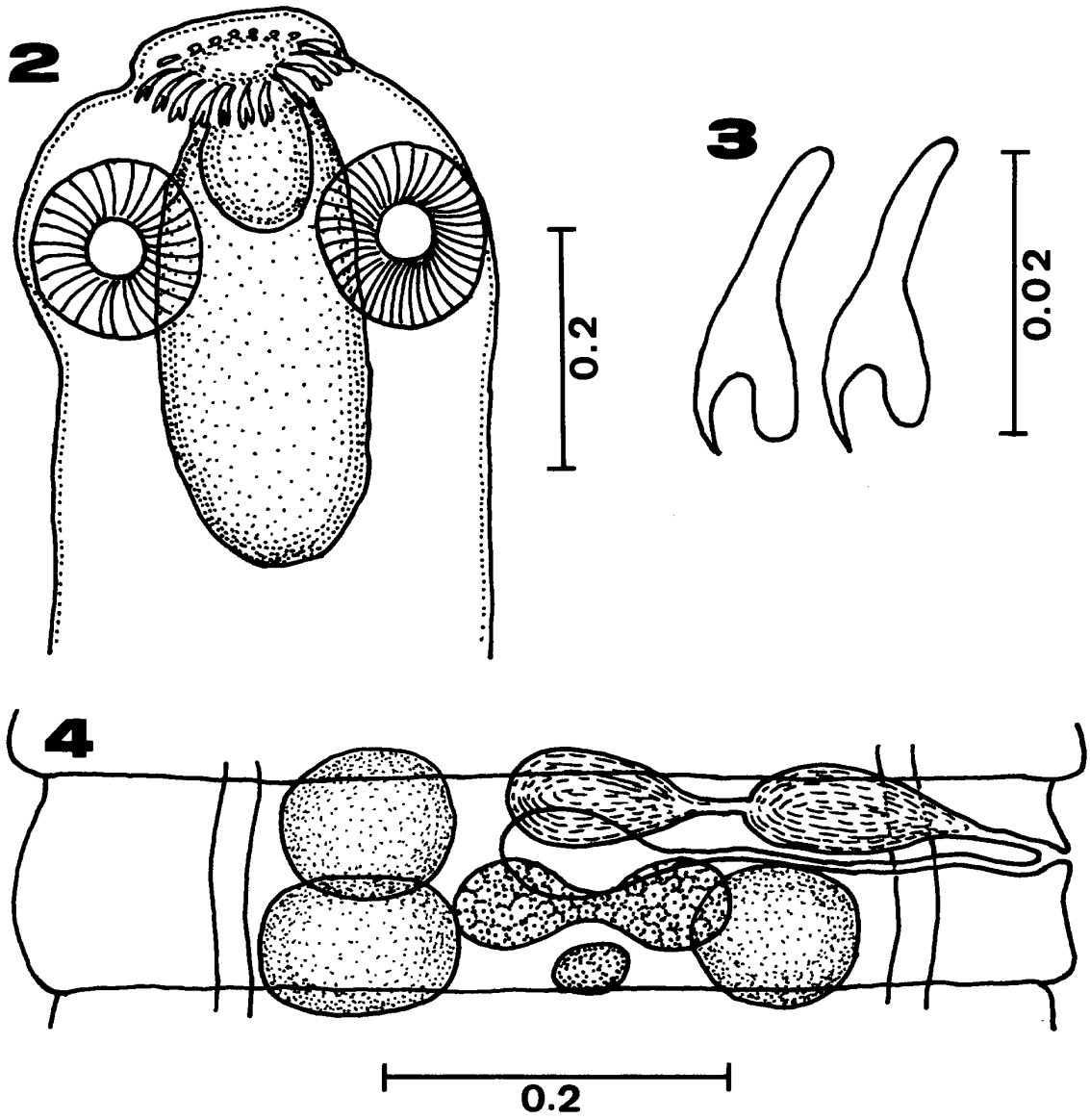
			R. affinis	2	1	50	*V. versihamata* sp. n.
	Forest		*C. sphinx*	4	0	0	
8	Lime grotto	6 Feb.	*Aselliscus stolizcanus*	6	0	0	
	Amphoe Samung, Chiang Mai						
			R. pusillus	3	0	0	
			H. fulvus	5	0	0	
			R. coelophyllus	1	1	100	*V. longicollaris* sp. n.
			R. stheno	2	1	50	*V. chiangmaiensis* sp. n.
			R. luctus	1	0	0	
			Myotis siligorensis	10	0	0	
			Miniopterus schreibersii	13	4	31	*V. taiwanensis*
		8 Feb.	*R. coelophyllus*	10	2	20	*V. acollaris* sp. n.
					1	10	*V. longicollaris* sp. n.
		9 Feb.	*R. coelophyllus*	7	2	29	*V. longicollaris* sp. n.
			M. scheribersii	1	1	100	*V. taiwanensis*
			Rousettus leschenaulti	1	0	0	
	Forest	6 Feb.	*Macroglossus* sp.	1	1	100	unidentified (no scolex)
			Pipistrellus sp.	1	1	0	
9	Lime grotto	5 Feb.	*R. stheno*	2	0	0	
	Amphoe Mae Rim, Chiang Mai		*R. malayanus*	2	0	0	
			R. affinis	1	0	0	
			R. coelophyllus	3	0	0	
			M. siligorensis	1	0	0	
			Pipistrellus pulveratus	1	0	0	
		6 Feb.	*H. bicolor*	2	0	0	
			R. coelophyllus	1	1	100	*V. longicollaris* sp. n.
			R. stheno	2	0	0	
	Forest		*Tylonycteris* sp.	1	0	0	

Vampirolepis siamensis sp. n.
(Figs. 2–4)

Of twelve *Hipposideros armiger* obtained from a lime grotto at Amphoe Bang Saphan Yai, Prachuap Khiri Khan, on January 26, 1982, one was found infected with three specimens of this cestode. They were fully mature, but not gravid.

Description: Small-sized hymenolepidid; strobila length 10; maximum width 0.58. Metamerism distinct, margins serrate. Proglottides wider than long. Scolex 0.830 by 0.359, not demarcated from neck. Rostellum pyriform, 0.166 long by 0.152 wide, armed with a single circle of 23 hooks. Hooks measuring 0.0245 long; hook handle long; guard bluntly round at its end, slightly shorter than blade; blade sharp at its end. Rostellar sac elongated, 0.401 long by 0.152 wide, extending far posteriorly to suckers. Suckers discoid, unarmed, 0.111–0.138 by 0.138. Neck very slender, 1.3 long by 0.32 wide.

Genital pores unilateral, situated in middle of proglottid margins. Testes three in number, oval or spherical, 0.077–0.84 by 0.084–0.091, arranged in form of triangle, one poral and two aporal. Cirrus sac pyriform, 0.126–0.161 long by 0.021 wide, extending anterolaterally beyond longitudinal excretory canals. Internal seminal vesicle en-



FIGS. 2–4. *Vampirolepis siamensis* sp. n.
2: Scolex. 3: Rostellar hooks. 4: Mature proglottid. Scales in mm.

larging to fill proximal portion of cirrus sac, measuring 0.105 by 0.021. External seminal vesicle 0.091–0.105 by 0.021, directly dorsal to seminal receptacle, situated in anterior half of proglottid. Vagina posterior to cirrus sac, passing behind cirrus sac, gradually expanding into seminal receptacle, measuring 0.049–0.063 by 0.065–0.070. Ovary transversely elongated, bilobed in mature proglottid, 0.119–0.126 wide. Vitelline gland compact, 0.042–0.056 by 0.035, situated near midline in space between poral and aporal testes, just posterior to ovary. Gravid and senile proglottides unknown.

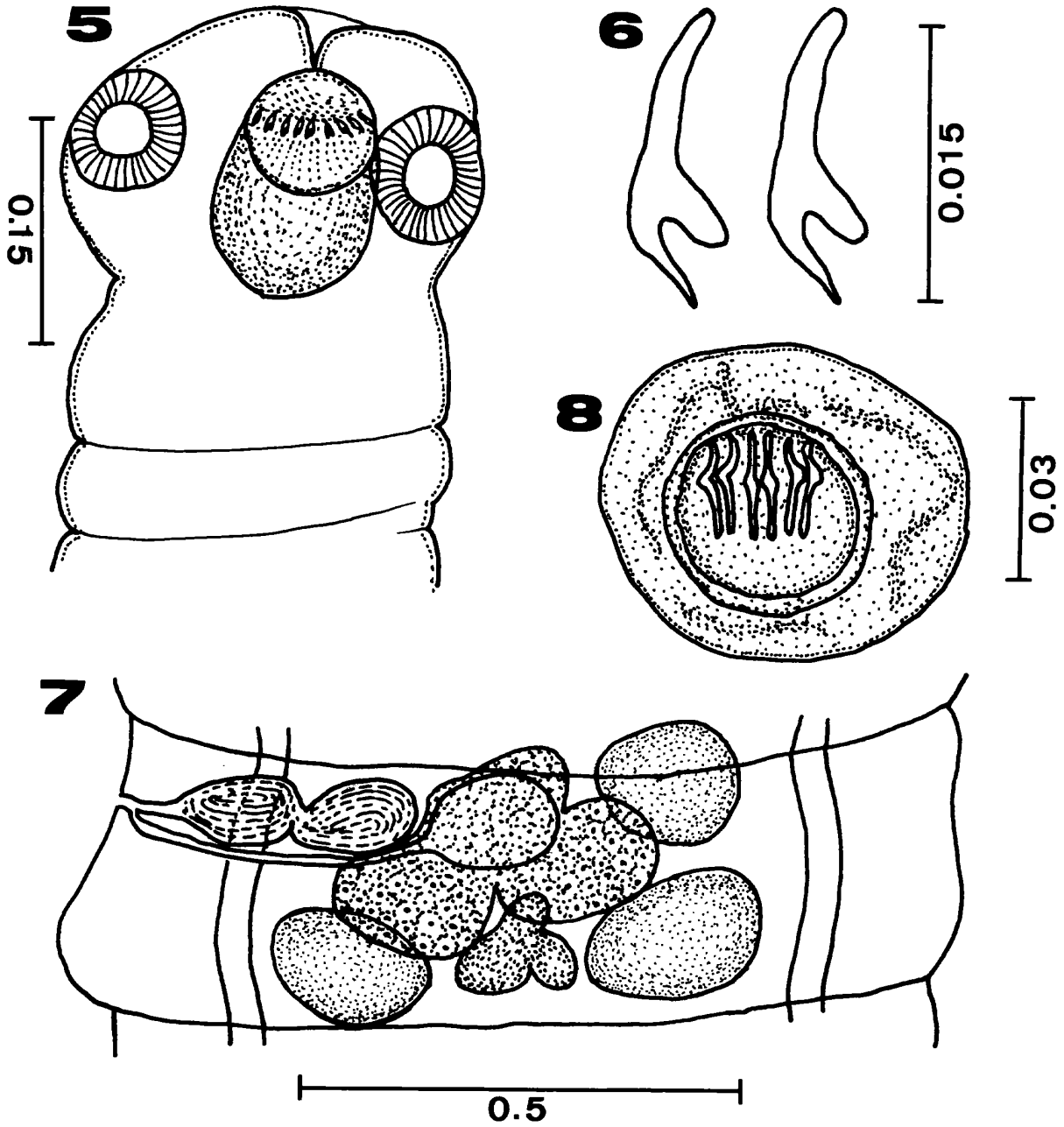
Type host: *Hipposideros armiger*.

Site of infection: Small intestine.

Type locality and date: Amphoe Bang Saphan Yai, Prachuap, Khiri Khan; February 26, 1982.

Type specimen: Holotype: NUE Lab. Coll. No. 8406. Paratypes: No. 8407.

Remarks: The nearest relative of the present species is *Vampirolepis iwatensis* Sawada, 1975 [1] from *Rhinolophus cornutus cornutus* and *R. ferrumequinum nippon*, in the number and length of the rostellar hooks. However, it differs from *V.*



FIGS. 5–8. *Vampirolepis curvihamata* sp. n.

5: Scolex. 6: Rostellar hooks. 7: Mature proglottid. 8: Egg. Scales in mm.

iwatensis in the larger scolex (0.830 by 0.359 vs. 0.210–0.245 by 0.224–0.231), larger rostellar sac (0.401 by 0.152 vs. 0.182 by 0.077), slenderer neck (1.3 vs. 0.455) and position of the genital pores (located at the middle of proglottid margin vs. located at a little anterior to the middle).

Vampirolepis curvihamata sp. n.
(Figs. 5–8)

Three specimens of this cestode occurred in the small intestine of one *Rhinolophus marshalli* caught in a lime grotto at Doi Chang Kieng, Chiang Mai, on February 3, 1982.

Description: Medium-sized hymenolepidid; mature strobila 42–45 long by 0.8–1.1 maximum wide. Metamerism distinct, craspedote, margins slightly serrate. Scolex somewhat round when the rostellum is invaginated, 0.189–0.280 by 0.280–0.294, not demarcated from neck. Rostellum spherical, 0.056–0.077 by 0.084, armed with a single circle of 30 hooks measuring 0.018 long. Hook handle long and curved; guard bluntly round at its end, shorter than blade; blade sharp at its end. Rostellar sac oval, 0.168 by 0.112–0.119, extending posteriorly to suckers. Suckers discoid, unarmed, 0.077–0.084 in diameter. All proglottides wider than long.

Genital pores unilateral, located at a little anterior to middle of proglottid margins. Testes three in number, spherical, 0.077–0.091 by 0.091–0.105, one poral and two antiporal, arranged triangularly. Cirrus sac pyriform, 0.105 by 0.031–0.035, extending beyond longitudinal excretory canals. Cirrus aspinose. Internal seminal vesicle, 0.049 by 0.028, gradually enlarged until filling proximal portion of cirrus sac. External seminal vesicle oval, 0.077–0.105 by 0.049–0.056. Vagina posterior to cirrus sac and external seminal vesicle. Seminal receptacle oval, 0.112 by 0.056, situated in anterior field of proglottid. Ovary transversely elongated, trilobate in anterior half of proglottid. Vitelline gland small, trilobate, 0.077–0.091 by 0.041–0.063, just posterior to ovary. Uterus arising directly from ovarian lobes as a lobe sac, gradually enlarging, filling whole available space in proglottid. Eggs spherical, 0.042–0.049 by 0.056, surrounded by thin envelopes, with smooth surface. Onchosphere spherical, 0.028–0.032 in diameter; embryonic hooks 0.018 long.

Type host: *Rhinolophus marshalli.*

Site of infection: Small intestine.

Type locality and date: Doi Chang Kieng, Chiang Mai; February 3, 1982.

Type specimen: Holotype: NUE Lab. Coll. No. 8408. *Paratypes*: No. 8409.

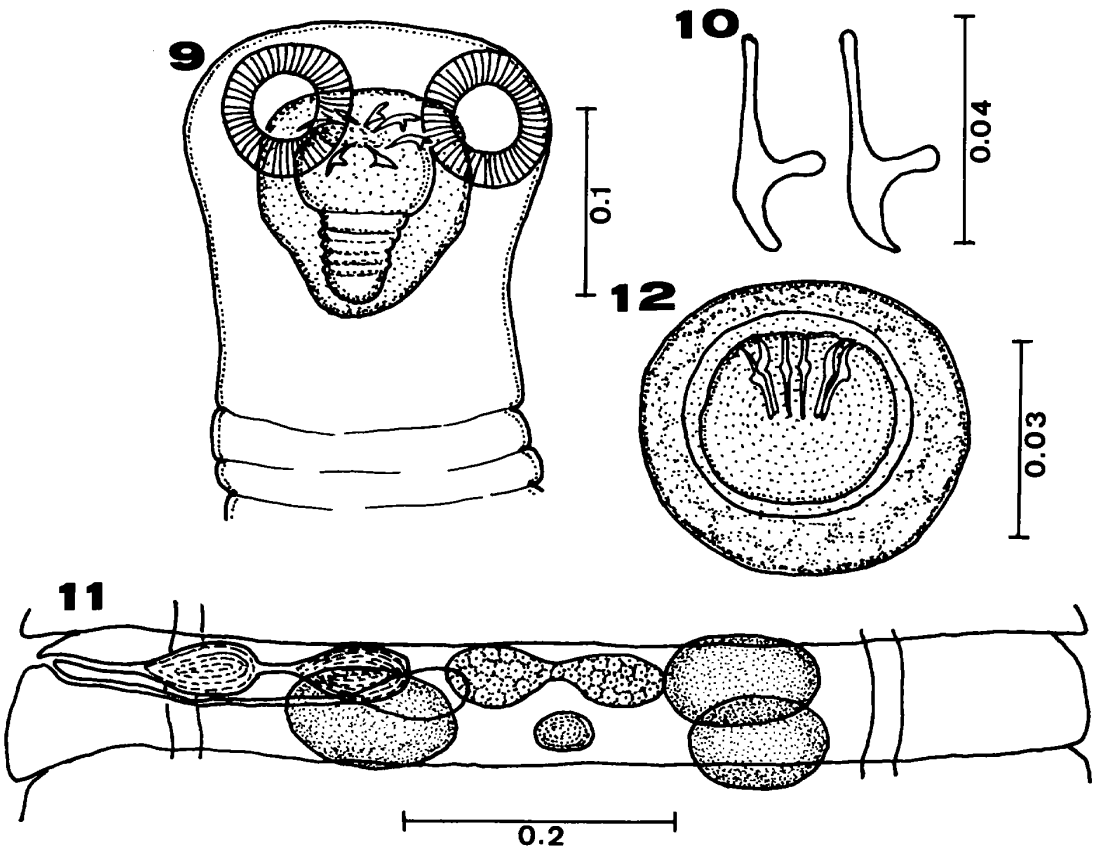
Remarks: The present new species closely resembles *V. ogaensis* Swada, 1974 [2], from *R. ferrumequinum nippon* in the number and length of rostellar hooks. However, it differs from *V. ogaensis* in the size of the neck (absence vs. extremely slender), shape of the rostellar hooks (hook handle curved vs. straight), the arrangement of the testes (triangular distribution vs. transverse row), the surface structure of the eggs (smooth vs. rough) and longer embryonic hooks (0.018 vs. 0.014).

Vampirolepis versihamata sp. n.
(Figs. 9–12)

Of two *Rhinolophus affinis* collected in a lime grotto at Doi Chang Kieng, Chiang Mai, on February 3, 1982, one was found infected with five specimens of this cestode.

Description: Small-sized hymenolepidid; worm length 19–27, maximum width 0.6–0.8. Scolex 0.161–0.175 long by 0.196 wide, not distinctly set off neck. Neck short. Rostellum 0.112–0.119 by 0.077–0.084, armed with a single row of 35 hooks measuring 0.035 long. Hooks characteristic, hook handle slender; guard round at its end; blade remarkably curved and sharp at its end, making a right angle with handle. Rostellar sac oval, 0.133–0.140 by 0.112–0.119, extending far posterior to suckers. Suckers round, 0.063–0.084 by 0.084.

Genital pores unilateral, located a little anterior to middle of proglottid margins, not protruding. Testes three in number, oval, 0.021 by 0.035, arranged in form of triangle. Cirrus sac pyriform, 0.070–0.077 long by 0.018 wide, extending anterolaterally beyond longitudinal excretory canals. Internal seminal vesicle 0.032–0.035 by 0.018, enlarging to fill proximal portion of cirrus sac. External seminal vesicle oval, 0.053 by 0.018, extending to poral testis and dorsal to seminal receptacle. Vagina opening in genital atrium,



FIGS. 9–12. *Vampirolepis versihamata* sp. n.
9: Scolex. 10: Rostellar hooks. 11: Mature proglottid. 12: Egg. Scales in mm.

extending medial, then enlarging, forming seminal receptacle. Seminal receptacle 0.053 by 0.025–0.028, extending medial to midline of proglottid. Ovary transversely elongate, 0.098–0.105 wide, bilobed in anterior half of proglottid. Vitelline gland weakly lobed, 0.025–0.035 by 0.018–0.021, situated posterior to ovary. Undeveloped uterus consisting of bilateral lobes connected by isthmus, gradually enlarging, filling whole proglottid. Eggs spherical, 0.053–0.056 in diameter, surrounded by thin outer covering, with smooth surface. Onchosphere spherical, 0.028–0.032 in diameter; embryonic hooks 0.014–0.018 long.

Type host: *Rhinolophus affinis*.

Site of infection: Small intestine.

Type locality and date: Doi Chang Kieng, Chiang Mai; February 3, 1982.

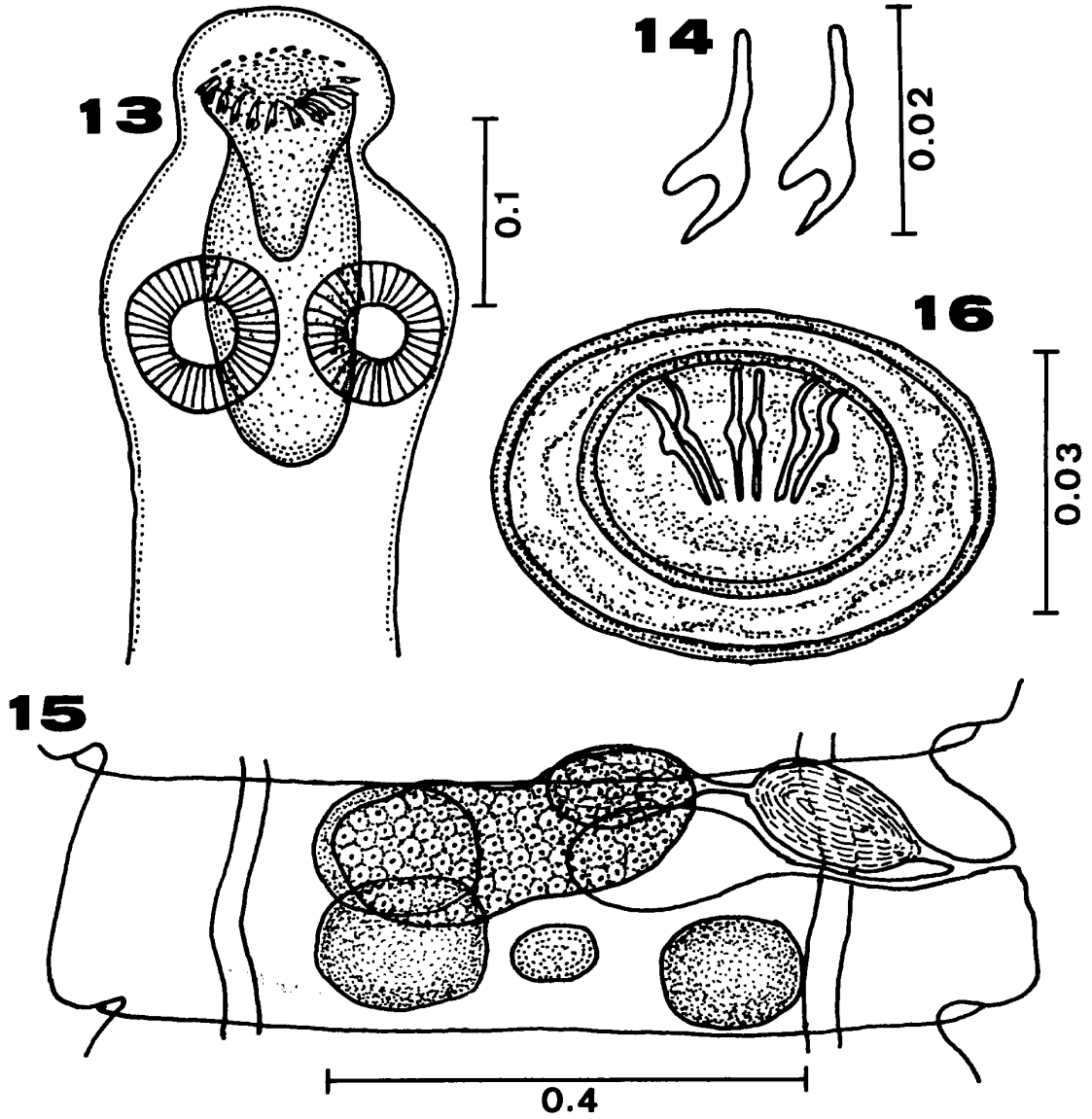
Type specimen: Holotype: NUE Lab. Coll. No. 8410. Paratypes: No. 8411.

Remarks: *V. versihamata* sp. n. most closely resembles *V. christensoni* Macy, 1931) comb. n. [3] from *Myotis lucifugus* and *V. gertschi* (Macy, 1947) comb. n. [4] from *Myotis californicus caurinus*. The rostellar hooks of *V. versihamata*, however, are characteristic in shape; the guard makes a right angle with handle. *V. versihamata* can also be separated from *V. christensoni* in the longer rostellar hooks (0.039 vs. 0.033) and arrangement of the testes (triangular distribution vs. transverse row). It differs from *V. gertschi* in the longer rostellar hooks (0.039 vs. 0.026–0.029) and arrangement of the testes (triangular distribution vs. transverse row).

Vampirolepis longicollaris sp. n.
(Figs. 13–16)

From February 6 to 9, 1982, 19 *Rhinolophus coelophyllus* were collected in a lime grotto at Chiang Mai. Five of them were found infected with 11 specimens of this cestode.

Description: Small-sized hymenolepidid; stroblila in mature specimens 13–17 in total length; greatest width 0.6–0.8. Metamerism distinct, craspedote, margins slightly serrate. Scolex 0.140–



FIGS. 13–16. *Vampirolepis longicollaris* sp. n.
13: Scolex. 14: Rostellar hooks. 15: Mature proglotiid. 12: Egg. Scales in mm.

0.245 long by 0.147–0.280 wide, distinctly set off from neck measuring 0.63–0.67 long by 0.12–0.15 wide. Suckers round, 0.063 in diameter. Rostellum 0.084–0.112 long by 0.084–0.098 wide, armed with a single circle of 28 hooks measuring 0.018 long. Hook handle long; guard bluntly round at its end, shorter than blade; blade sharp at its end.

Genital pores unilateral, located at a little posterior to the middle of proglottid margins. Testes three in number, spherical or oval, 0.056–0.084 by 0.035–0.084, arranged in form of triangle, one poral and two aporal. Cirrus sac, pyriform, 0.077–0.146 by 0.042–0.077, extending anterolaterally beyond longitudinal excretory canals. Internal seminal vesicle, gradually enlarging to fill proximal portion of cirrus sac measuring 0.056–0.077 by 0.028–0.035. External seminal vesicle, 0.077–0.140 by 0.042–0.098, directly dorsal to seminal receptacle, situated in anterior field of proglottid. Vagina initially posterior to cirrus sac, passing behind cirrus sac, gradually expanding into voluminous seminal receptacle measuring 0.084–0.094 by 0.042–0.049. Ovary transversely elongated and bilobed, 0.140–0.203 wide. Vitelline gland compact, lobed, 0.049–0.056 by 0.035–0.039, situated near midline in space between poral and aporal testes in posterior field of proglottid. Uterus arising from ovarian lobes as lobe sac,

gradually enlarging, filling entire whole part of senile proglottid. Eggs oval, 0.046–0.053 by 0.035–0.039; outermost chorion thin, with smooth surface; embryonic hooks 0.018 long.

Type host: *Rhinolophus coelophyllus*.

Site of infection: Small intestine.

Type locality and date: Amphoe Samung, Chiang Mai; February 6, 1982.

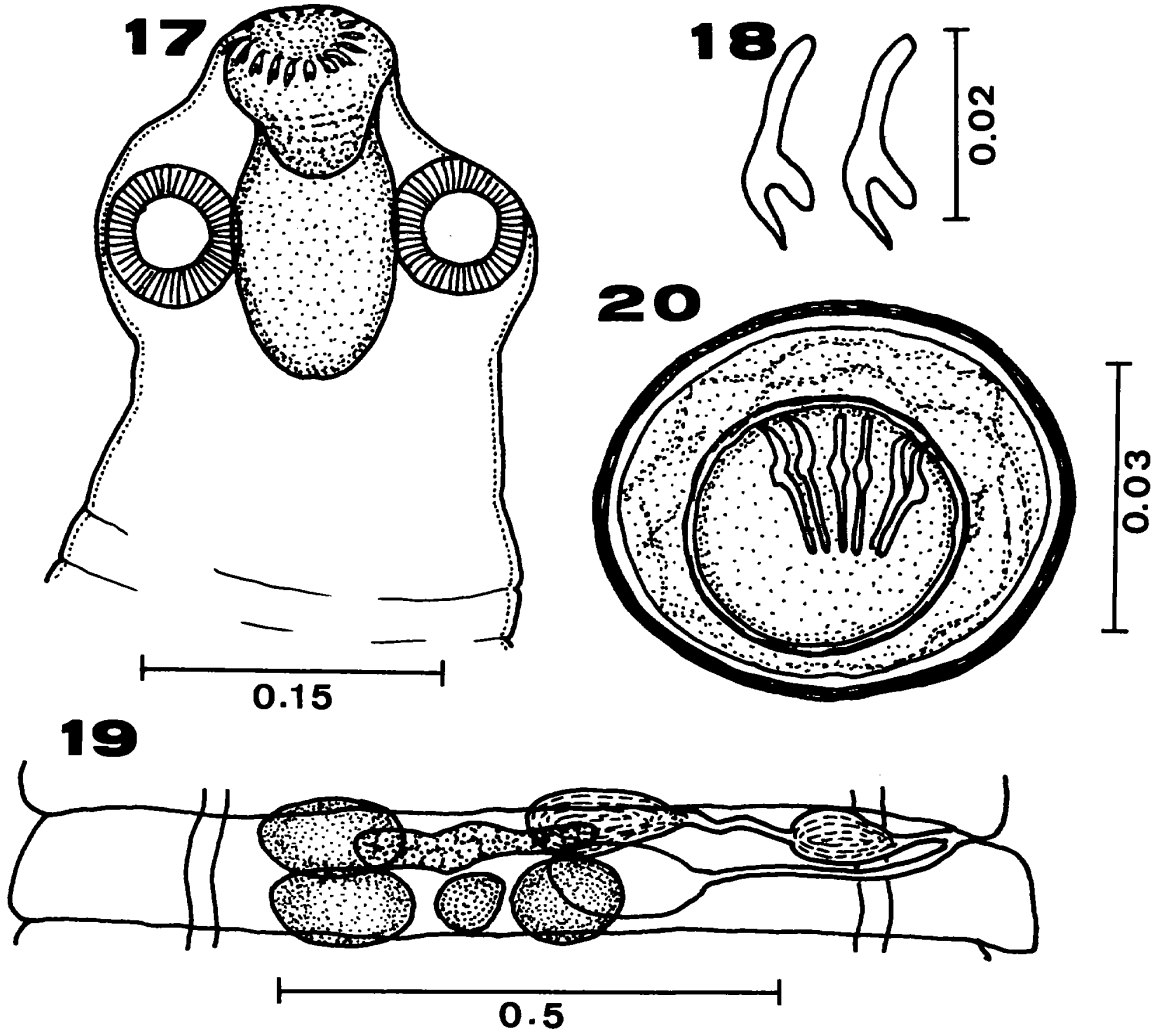
Type specimen: Holotype: NUE Lab. Coll. No. 8412. Paratypes: No. 8413.

Remarks: *V. longicollaris* sp. n. most closely resembles *V. iriomotensis* Sawada, 1983 [5] from *R. imaizumii* and *R. perdirus* in the number and length of the rostellar hooks, and form and size of the eggs. However, it differs from *V. iriomotensis* in the form of the rostellar hooks (blade remarkably sharp at its end vs. blade blunty shape), the longer neck (0.63–0.67 long vs. 0.18) and the arrangement of the testes (triangular distribution vs. transverse row).

Vampirolepis chiangmaiensis sp. n.
(Figs. 17–20)

Of two *Rhinolophus stheno* collected in a lime grotto at Amphoe Samung, Chiang Mai, on February 6, 1982, one was found infected with three specimens of this cestode.

Description: Small-sized hymenolepidid; strobila 13–16 long by a maximum width of 0.7–0.9. Metamerisum distinct, craspedote, margins slightly serrate. Scolex 0.147–0.175 long by 0.224–0.252 wide, with round suckers measuring 0.070–0.077 in diameter. Rostellum well developed, 0.084–0.126 by 0.077–0.098 and provided with a rostellar sac, 0.140 long by 0.105–0.112 wide and a crown of 24 hooks 0.012 long. Hook handle



FIGS. 17–20. *Vampirolepis chiangmaiensis* sp. n.
17: Scolex. 18: Rostellar hooks. 19: Mature proglottid. 20: Egg. Scales in mm.

long; guard bluntly round at its end, shorter than blade; blade pointed at its end.

Genital pores unilateral, situated at the extremely anterior margins of each proglottid. Testes 0.070–0.091 by 0.056, with one poral and two aporal in position, arranged in form of triangle. External seminal vesicle 0.070–0.077 by 0.028–0.035. Internal seminal vesicle, 0.063–0.070 by 0.025–0.035, gradually enlarging until filling proximal portion of cirrus sac. Cirrus sac, 0.098–0.105 long by 0.028–0.035 wide, extending beyond longitudinal excretory canals. Ovary narrow, not appreciably lobed, 0.266–0.277 wide, placed midway between longitudinal excretory canals. Vitelline gland round, directly posterior to ovary, 0.056–0.070 by 0.035. Seminal receptacle prominent, 0.091 by 0.042, retort-shaped in gravid proglottides. Egg oval or spherical, 0.049–0.056 by 0.039–0.046, surrounded by four envelopes; outermost chorion slightly thick, with smooth surface. Onchospheres spherical, 0.025–0.028 by 0.025–0.032; embryonic hooks 0.018 long.

Type host: *Rhinolophus stheno*.

Site of infection: Small intestine.

Type locality and date: Amphoe Samung, Chiang Mai; February 6, 1982.

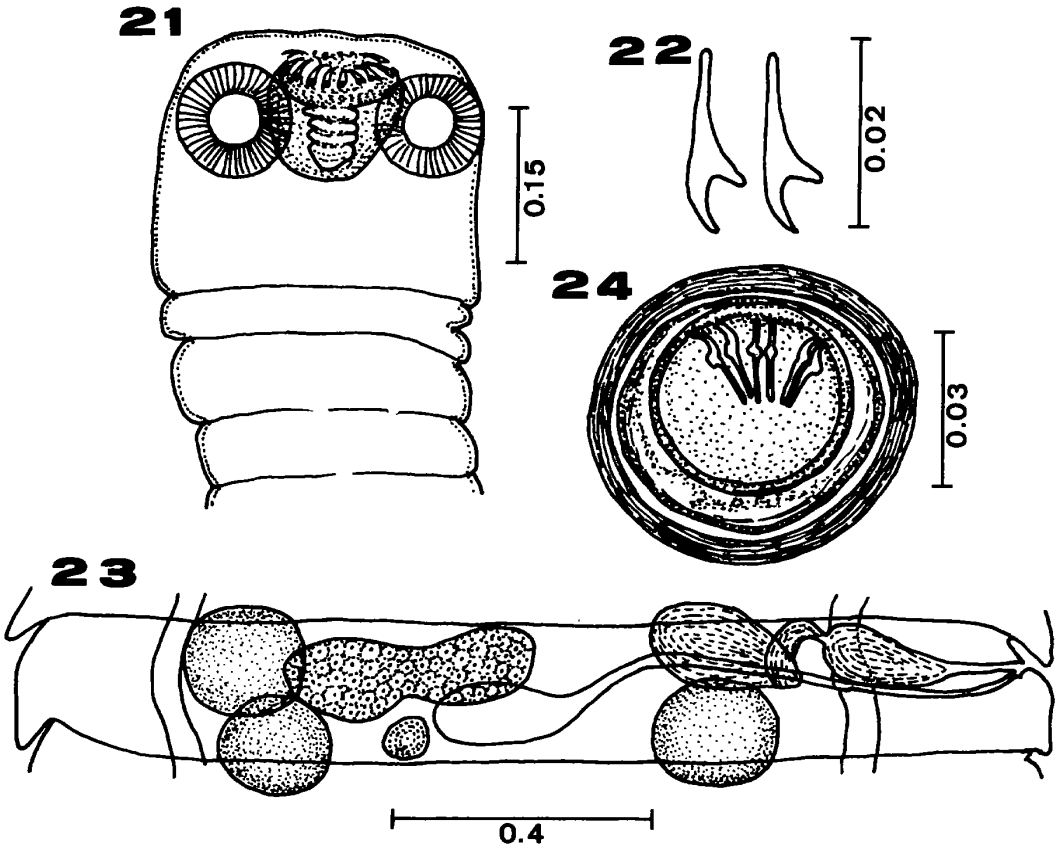
Type specimen: Holotype: NUE Lab. Coll. No. 8414. Paratypes: No. 8415.

Remarks: The present species closely resembles *V. minatoi* Sawada, 1983 [5] from *Miniopterus schreibersii fuliginosus* in the length of rostellar hooks. However, it differs from *V. minatoi* in the number of rostellar hooks (14 vs. 20), form of the rostellar hooks (blade longer than guard vs. blade shorter than guard), thickness of the outermost chorion of eggs (slightly thick vs. fairly thick) and longer embryonic hooks (0.018 vs. 0.011).

Vampirolepis acollaris sp. n.
(Figs. 21–24)

Of ten *Rhinolophus coelophyllus* collected in a lime grotto at Amphoe Samung, Chiang Mai, on February 8, 1982, two were found infected with two mature specimens of this cestode.

Description: Medium-sized hymenolepidid; strobila 39–51 in length; maximum width 1.4–1.8.



FIGS. 21–24. *Vampirolepis acollaris* sp. n.
21: Scolex. 22: Rostellar hooks. 23: Mature proglottid. 24: Egg. Scales in mm.

Scolex small, tetragonal, 0.175–0.224 long by 0.224–0.280 wide. Rostellum introverted in both specimens, 0.105–0.115 by 0.098–0.105, with a single row of 25 small hooks 0.028–0.032 long. Handle of hooks long; guard bluntly round at its end, shorter than blade; blade sharp at its end. Rostellar sac small, 0.126–0.175 by 0.112–0.119, extending to the posterior edge of suckers. Suckers round, shallow, 0.105 in diameter. Neck absent. Numerous proglottides much broader than long.

Genital pores unilateral, located at a little anterior to middle of proglottid margins. Testes arranged triangularly, one poral and two aporal, 0.112–0.054 by 0.091–0.140. Cirrus sac, pyriform, 0.161–0.175 long by 0.049–0.063 in the greatest diameter, extending beyond longitudinal excretory canals. Cirrus aspinose. Internal seminal vesicle 0.084–0.112 long by 0.042–0.063 in the greatest diameter, occupying most part of cirrus sac. Duct from internal seminal vesicle making loop at aporal end of cirrus sac, then forming ellipsoidal external seminal vesicle measuring 0.224–0.245 by 0.049–0.077 and situated anterior to poral testis. Seminal receptacle globular, 0.175–0.210 in transverse length by 0.126–0.133 in the greatest diameter, extending beyond midline of proglottid.

Ovary usually weakly bilobed, 0.350–0.385 in the greatest length. Vitelline gland compact, with entire margins, 0.070 by 0.056, situated just posterior to ovary. Undeveloped uterus, consisting of bilateral lobes connected anteriorly to each other by isthmus. Uterus filling space between longitudinal excretory canals or often overlapping canals in gravid proglottides. Eggs subspherical, 0.049–0.056 by 0.042–0.049, surrounded by four envelopes; outermost chorion thick and with smooth surface. Onchospheres spherical, 0.028–0.032 in diameter; embryonic hooks 0.014 long.

Type host: *Rhinolophus coelophyllus.*

Site of infection: Small intestine.

Type locality and date: Amphoe Samung, Chiang Mai; February 8, 1982.

Type specimen: Holotype: NUE Lab. Coll. No. 8416. Paratypes: No. 8417.

Remarks: The present new species closely resembles *V. isensis* Sawada, 1966 [6] from *R. ferrumequinum nippon*, *R. cornutus cornutus*, *R. cornutus orii*, *R. perditus* and *R. imaizumii* in the form, number and length of the rostellar hooks. However, it differs from *V. isensis* in the size of the neck (absence vs. 0.140–0.175), size of the suckers (0.105 in diameter vs. 0.070–0.088) and arrangement of the testes (triangular distribution vs. transverse row).

Vampirolepis taiwanensis Sawada, 1984

Fourteen bent-winged bats, *Miniopterus schrebersii fuliginosus*, were collected at Amphoe Samung, Chiang Mai, on February 6 and 9, 1982. Five of them harbored 26 specimens of *V. taiwanensis* [7].

Strobila length 26–70; maximum width 0.15–2.1. Scolex 0.280–0.346 by 0.428–0.595; rostellum 0.083–0.140 by 0.097–0.105; armed with a single row of 23–28 hooks, 0.021 long. Suckers round, 0.119–0.153 in diameter. Neck absent. Genital pores unilateral, located at a little posterior to middle of proglottid margins. Eggs 0.033–0.039 by 0.037–0.049, surrounded by four envelopes; outermost chorion thick, with rough surface. Onchosphere spherical 0.025–0.028 by 0.026–0.032; embryonic hooks 0.014 long.

Vampirolepis sp. 1

Twelve specimens of *Hipposideros armiger* were collected in a lime grotto at Amphoe Bang Saphan Yai, Prachuap, Khiri Khan, on January 29, 1982. One of them harbored two minute juvenile cestodes belonging to the genus *Vampirolepis*.

Worm 2.2–2.8 long by 0.34–0.42 wide. Scolex 0.245–0.259 by 0.336–0.350. Rostellum 0.056 by 0.070, armed with a single row of hooks 0.018 long. Rostellar sac 0.210 by 0.084. Suckers round, 0.091–0.105 by 0.077–0.084. Neck 0.7 long by 0.105 wide. Mature and gravid proglottides unknown.

Vampirolepis sp. 2

Fourteen specimens of *Taphozous melanopogon* were collected in a lime grotto at Amphoe Muang, Nakhon Sawan, on February 1, 1982. One of them harbored two minute juvenile cestodes belonging to the genus *Vampirolepis*.

Total length 1.4–1.6 by width 0.6–0.7. Scolex 0.350–0.364 by 0.315–0.343. Rostellum pyriform, 0.119 by 0.098, armed with a single row of about 50 hooks 0.035 long. Rostellar sac 0.175 by 0.126. Suckers round, 0.077–0.084 in diameter. Proglottides unknown.

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